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SC-2601

August 3, 1966

FACILITY FORM 602	N66-86515 (ACCESSION NUMBER)	(THRU)
	2 (PAGES)	None (CODE)
	CR 77662 (NASA CR OR TMX OR AD NUMBER)	(CATEGORY)

Lunar and Planetary Programs
Office of Space Science and Applications
NASA Headquarters
Washington, D. C.

Attention: Capt. W. T. O'Bryant

Subject: Report No. IITRI W6135-9
July 1, 1966 through July 31, 1966
"Lunar and Planetary Programs Analysis Group"
Contract No. NASr-65(06)

Gentlemen:

1. Work Performed During Period Under Review

1.1 Objectives of Advanced Missions

Work was completed on the study of the Mission Requirements of Exobiological Measurements on Venus. A report has been submitted to NASA for approval.

Work was completed on the study of measurements related to the Origin and Evolution of the Solar System.

1.2 Analysis of Mission Requirements

Work has continued on the accessible regions method of presentation of gravity assist trajectories. Jupiter is being used as the gravity assist body for the first presentation.

The study of the "Grand Tour" mission study has been continued. The gravity-assist trajectory code SPARC has been received from JPL and is operational.

1.3 General Trajectory Studies

The analysis of comet and asteroid orbit determination has continued. The computer programs have been checked out and are operating satisfactorily. A report on this study is about to be written.

Formerly Armour Research Foundation
of Illinois Institute of Technology

Work has continued on the study of low thrust payloads and their comparison with ballistic payloads. Jupiter is being used as a sample target.

1.4 Spacecraft Technology Studies for Mission Analysis

The study of the feasibility of atmospheric probes for entering the atmosphere of Jupiter has been continued. Attempts are being made to define the mechanisms of heating and heat dissipation in the high density and relatively ill-defined atmosphere of Jupiter.

The study of future deep space communication problems is nearing completion. Part 2 of the report on this study is being reviewed internally.

1.5 Cost Estimation Methods

The study of the relative costs of exploring the outer planets has been continued. Basic design concepts for the Advanced Planetary Probe and an Advanced Planetary Voyager are being assumed.

2. Discussions and Visits

2.1 July 5, 1966 - Denver, Colorado

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J. Niehoff

2.1.1 Subject: Attendance at AAS Space Flight Mechanics Specialists Conference

2.2 July 17-19, 1966 - JPL

ASC

J. Niehoff

JPL

J. Cutting, et al.

2.2.1 Subject: To pick up SPARC computer program and discuss multiple missions.

3. Reports Submitted

3.1 T-17 "Low-Thrust Trajectory Capabilities for Exploration of the Solar System," sent to NASA for approval.

3.2 P-14 "Analytical Methods and Observational Requirements for Interpretation of Asteroid Distributions," sent to NASA for approval.

3.3 P-16 "Mission Requirements of Exobiological Measurements on Venus" submitted to NASA for approval.